

Volume 2

A17 - Surface Water Baseline Monitoring Results



Surface Water Baseline Monitoring Results

Table 1: Surface Water Analytical Results (physico-chemical, nitrites & nitrates, alkalinity, anions & cations)

Sample Date	Sampling Event	Sample Duplicate	Sample Number	Material Type	Aesthetic Parameters		Physico-Chemical Parameters						Chlorophyll (mg/L)	Fluoride (mg/L)	Nitrites & Nitrates (mg/L)					Hydroxide Alkalinity as CaCO3 (mg/L)	Carbo-te Alkalinity as CaCO3 (mg/L)	Bicarbo-te Alkalinity as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	Sulfate as SO4 (mg/L)	Anions and Cations (mg/L)									
					Sheen	Odour	pH (pH unit)	TDS (mg/L)	TSS (mg/L)	Turbidity (NTU)	Dissolved Organic Carbon (mg/L)	Dissolved Oxygen (mg/L)			Electrical Conductivity (µS/cm)	Ammonium as N	Ammonia as N	Nitrite & Nitrate	TKN						Total N	Chloride	Calcium	Magnesium	Sodium	Potassium	Reactive P	Total Anions	Total Cations	Ionic Balance (%)
Laboratory Level of Reporting																																		
Main Dam																																		
5/07/2018	Baseline 2	-	DAM	SW	None	None	8.03	228	-	-	14	11.8	354	-	-	0.04	0.07	0.02	1.5	1.5	<1	<1	96	96	59	14	30	3	39	5	<0.01	4	4	0.38
02/08/2018	Baseline 3	-	DAM	SW	None	None	8.6	246	52	111	12	9.9	360	12	0.6	0.03	0.04	0.02	3.4	3.4	<1	9.0	76	84	69	21	25	3	45	5	<0.01	4	4	1.75
30/08/2018	Baseline 4	-	DAM	SW	None	None	8.66	334	72	174	26	10.3	405	-	-	0.03	0.05	0.07	2.9	3.0	<1	19.0	69	89	94	20	21	3	66	7	<0.01	4	4	0.52
26/09/2018	Baseline 5	-	DAM	SW	None	None	8.96	328	77	116	22	9.7	448	-	0.9	0.03	0.05	0.07	2.9	3.0	<1	19.0	69	89	94	20	21	3	66	7	<0.01	4	4	0.52
24/10/2018	Baseline 6	-	DAM	SW	None	None	7.98	440	390	915	26	6.3	529	-	0.5	0.09	0.12	<0.01	3.7	3.7	<1	<1	138	138	92	29	21	3	92	7	<0.01	5	5	0.14
26/03/2019	Baseline 7	-	DAM	SW	None	None	8.29	223	205	212	8	8.1	328	-	-	-	-	<0.01	0.9	0.9	<1	2.0	95	98	63	4	39	3	27	4	<0.01	3	3	1.27
21/05/2019	Baseline 8	-	DAM	SW	None	None	8.24	218	33	39	54	8.4	346	-	0.1	0.06	0.09	<0.01	0.8	0.8	<1	<1	63	63	92	7	28	3	43	4	<0.01	3	4	3.51
4/07/2019	Baseline 9	-	DAM	SW	None	None	8.81	254	28	34	7	10.0	397	-	-	0.02	0.05	0.01	0.5	0.5	<1	8.0	61	69	101	10	23	3	53	5	<0.01	4	4	0.85
4/07/2019	Baseline 9	DAM	QAQC11	SW	None	None	8.69	244	23	34	7	9.6	396	-	-	-	0.10	<0.01	0.6	0.6	<1	7.0	61	68	102	10	20	4	61	4	<0.01	4	4	4.06
30/07/2019	Baseline 10	-	DAM	SW	None	None	8.4	291	31	37	7	9.8	452	-	-	0.0	0.05	<0.01	0.8	0.8	<1	3.0	84	88	104	14	24	4	70	6	<0.01	4	5	4.50
28/08/2019	Baseline 11	-	DAM	SW	None	None	8.66	374	30	66	8	9.6	511	-	-	0.03	0.08	<0.01	0.8	0.8	<1	9.0	80	88	118	19	19	4	70	5	<0.01	5	4	3.27
Alick Creek U/S																																		
5/07/2018	Baseline 2	-	A-CK	SW	None	None	8.45	350	-	-	12	10.0	466.0	-	-	-	-	-	-	-	<1	13	215	228	15	10	29	4	73	5	0.01	5.2	5.1	0.7
02/08/2018	Baseline 3	-	AC-US	SW	None	None	8.45	400	82	270	14	9.0	593.0	15.0	0.4	0.08	0.10	0.02	1.5	1.5	<1	15	254	269	25	20	26	4	95	5	0.01	6.5	5.9	4.6
29/08/2018	Baseline 4	-	AC-US	SW	DRY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
26/09/2018	Baseline 5	-	AC-US	SW	DRY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
25/10/2018	Baseline 6	-	AC-US	SW	DRY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
26/03/2019	Baseline 7	-	AC-US	SW	None	None	8.36	214	81	125	9.0	7.3	291.0	-	0.2	0.05	0.06	<0.01	1.60	1.60	<1	7	133	140	15	4	28	3	34	4	0.02	3.2	3.2	0.1
21/05/2019	Baseline 8	-	AC-US	SW	None	None	8.27	243	170	220	35.0	7.7	366.0	-	-	0.05	0.06	<0.01	1.60	1.60	<1	<1	177	177	20	7	32	4	53	4	<0.01	4.2	4.3	2.2
4/07/2019	Baseline 9	-	AC-US	SW	DRY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
30/07/2019	Baseline 10	-	AC-US	SW	None	None	8.22	194	90	91.8	7.0	9.2	307.0	-	-	0.04	0.05	<0.01	2.10	2.10	<1	<1	146	146	21	6	19	4	48	5	<0.01	3.5	3.5	0.4
Flinders River U/S																																		
6/07/2018	Baseline 2	-	FL-US	SW	None	None	8.2	216	-	-	9.0	8.0	344.0	-	-	-	-	-	-	-	<1	<1	139.0	139.0	23.0	14.0	38.0	8.0	21.0	5	<0.01	3.7	3.6	0.8
01/08/2018	Baseline 3	-	FL-US	SW	None	None	8.25	220	20.0	27.8	17.0	8.9	374.0	4.0	0.1	0.07	0.08	0.01	0.6	0.6	<1	4.0	131.0	135.0	35.0	15.0	39.0	9.0	25.0	5	<0.01	3.9	3.9	0.7
29/08/2018	Baseline 4	-	FL-US	SW	None	None	8.48	256	<5	7.7	10	9.3	423	-	-	0.05	0.05	0.01	1.3	1.3	<1	9	124	132	49	26	36	10	33	6	<0.01	4.39	4.21	2.12
26/09/2018	Baseline 5	-	FL-US	SW	None	None	8.15	350	7	11.9	15	8.9	528	-	0.2	<0.01	0.01	<0.01	0.9	0.9	<1	<1	144	144	88	23	37	12	49	8	<0.01	5.36	5.17	1.79
25/10/2018	Baseline 6	-	FL-US	SW	None	None	8.27	468	25	45.8	18	7.9	684	-	0.2	0.05	0.06	<0.01	1.4	1.4	<1	<1	142	142	139	38	36	15	85	10	<0.01	6.8	6.98	1.31
26/03/2019	Baseline 7	-	FL-US	SW	None	None	8.49	229	13	10.4	6	8.7	380	-	-	-	-	<0.01	0.4	0.4	<1	17.0	137	155	35	12	50	10	21	5	<0.01	4.16	4.36	2.29
20/05/2019	Baseline 8	-	FL-US	SW	None	None	8.16	195	171	55.1	4	8.4	322	-	0.2	0.04	0.09	<0.01	0.3	0.3	<1	<1	128	128	44	9	46	9	21	4	<0.01	3.73	4.05	4.17
3/07/2019	Baseline 9	-	FL-US	SW	None	None	8.11	221	20	18.3	6	7.8	368	-	-	0.02	0.03	<0.01	0.3	0.3	<1	<1	130	130	48	10	41	8	22	4	<0.01	3.88	3.76	1.51
30/07/2019	Baseline 10	-	FL-US	SW	None	None	8.14	252	18	16.3	9	8.4	392	-	-	0.03	0.03	<0.01	0.5	0.5	<1	<1	137	137	56	11	45	10	25	5	<0.01	4.21	4.28	0.83
27/08/2019	Baseline 11	-	FL-US	SW	None	None	8.15	300	6	8	6	9.3	428	-	-	0.04	0.06	0.01	0.5	0.5	<1	<1	123	123	84	13	41	10	28	4	<0.01	4.57	4.19	4.38
Flinders River D/S																																		
6/07/2018	Baseline 2	-	FL-DS	SW	None	None	8.18	227	-	-	5.0	9.1	353.0	-	-	-	-	-	-	-	<1	<1	152	152	18	14	40	7	24	4	<0.01	3.8	3.7	1.2
02/08/2018	Baseline 3	-	FL-DS	SW	None	None	8.1	214	6.0	12.0	12.0	8.3	369.0	2.0	0.2	0.08	0.08	<0.01	0.3	0.3	<1	<1	144	144	22	13	40	7	25	4	<0.01	3.7	3.8	0.8
30/08/2018	Baseline 4	-	FL-DS	SW	None	None	8.41	190	17	47.5	6	8.8	291	-	-	<0.01	<0.01	0.03	1.9	1.9	<1	7	115	122	11	20	30	6	20	4	<0.01	3.23	2.96	4.32
26/09/2018	Baseline 5	-	FL-DS	SW	None	None	8.34	197	10	21.5	7	9.7	287	-	0.2	0.03	0.04	<0.01	0.6	0.6	<1	4	121	124	12	14	29	6	21	5	<0.01	3.12	2.98	2.29
24/10/2018	Baseline 6	-	FL-DS	SW	None	None	8.3	208	30	39	8	8.4	307	-	0.1	0.01	0.02	<0.01	0.8	0.8	<1	<1	133	133	8	14	30	7	24	5	<0.01	3.22	3.24	0.4
26/03/2019	Baseline 7	-	FL-DS	SW	None	None	8.4	216	10	12.1	9	8.5	367	-	-	-	-	<0.01	0.4	0.4	<1	15	132	147	34	12	48	9	21	5	<0.01	3.98	4.18	2.37
26/03/2019	Baseline 7	FL-DS	QC1	SW	None	None	8.49	232	11	11.6	9	8.7	382	-	-	-	-	0.03	0.4	0.4	<1	18	136	155	35	12	50	10	21	5	<0.01	4.16	4.36	2.29
26/03/2019	Baseline 7	FL-DS	QC2	SW	None	None	8.5	140	18	1.3	11	9.3	-	-	-	-	<0.05	0.3	0.3	<1	-	-	-	37	10	41	9.7	20	5					

Table 2: Surface Water Analytical Results (TRH, BTEX & Inorganics)

Sample Date	Sampling Event	Sample Duplicate	Sample Number	Material Type	Organics										Inorganics (mg/L)														Metals (Total)																															
					TRH (µg/L)				BTEX (µg/L)						Metals (Dissolved)														Metals (Total)																															
					C ₆ -C ₁₀	>C ₁₀ -C ₁₄	>C ₁₄ -C ₂₄	>C ₂₄	Benzene	Toluene	Ethylbenzene	o-xylene	p-xylene	Xylenes (total)	Al (pH >6.5)	As (III)	Ba	Be	B	Cd	Cr (III)	Co	Cu	Fe	Pb	Mn	Hg	Ni	Se	U	V	Zn	Al (pH >6.5)	As (III)	Ba	Be	Bo	Cd	Cr (III)	Co	Cu	Fe	Pb	Mn	Hg	Ni	Se	U	V	Zn										
Laboratory Level of Reporting					50	100	100	100	1	2	2	2	2	2	0.01	0.001	0.001	0.001	0.05	0.0001	0.001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.01	0.001	0.01	0.005	0.01	0.001	0.001	0.001	0.05	0.0001	0.001	0.001	0.001	0.05	0.001	0.001	0.001	0.001	0.01	0.001	0.001	0.001	0.05	0.001	0.001	0.001	0.001	0.01	0.001	0.001	0.001	0.005
Main Dam																																																												
5/07/2018	Baseline 2	-	DAM	SW	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.02	0.002	0.026	<0.001	0.11	<0.001	<0.001	<0.001	0.003	<0.05	<0.001	0.001	<0.001	0.001	<0.01	<0.001	<0.01	<0.005	3.85	0.003	0.044	<0.001	0.10	0.0001	0.002	0.001	0.006	2.59	0.001	0.121	<0.001	0.003	<0.01	<0.001	0.02	0.009										
02/08/2018	Baseline 3	-	DAM	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.03	0.003	0.021	<0.001	0.12	<0.001	<0.001	<0.001	0.014	<0.05	<0.001	0.001	<0.001	0.001	<0.01	<0.001	<0.01	0.013	4.17	0.003	0.039	<0.001	0.12	<0.001	0.003	0.001	0.005	2.96	<0.001	0.077	<0.001	0.003	<0.01	<0.001	0.02	0.014										
30/08/2018	Baseline 4	-	DAM	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.06	0.002	0.023	<0.001	0.11	<0.001	<0.001	<0.001	0.002	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.001	<0.01	0.01	<0.005	7.28	0.003	0.066	<0.001	0.12	0.0001	0.004	0.001	0.006	4.84	0.002	0.116	<0.001	0.005	<0.01	0.001	0.02	0.014									
26/09/2018	Baseline 5	-	DAM	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.07	0.003	0.020	<0.001	0.13	<0.001	<0.001	<0.001	0.004	<0.05	<0.001	0.005	<0.001	0.001	<0.01	0.001	0.01	0.013	5.85	0.004	0.046	<0.001	0.18	0.0001	0.004	0.002	0.005	4.08	0.001	0.156	<0.001	0.004	<0.01	0.001	0.02	0.011										
24/10/2018	Baseline 6	-	DAM	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.19	0.005	0.024	<0.001	0.21	<0.001	<0.001	<0.001	0.008	0.11	<0.001	0.008	<0.001	0.001	<0.01	0.001	0.01	0.010	20.80	0.011	0.678	<0.001	0.20	0.0005	0.013	0.009	0.016	14.80	0.008	0.791	<0.001	0.014	<0.01	0.001	0.07	0.048										
25/03/2019	Baseline 7	-	DAM	SW	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<0.01	0.003	0.033	<0.001	0.08	<0.001	<0.001	<0.001	0.001	<0.05	<0.001	0.011	<0.001	<0.001	<0.01	<0.001	<0.01	<0.005	8.37	0.004	0.076	<0.001	0.08	<0.001	0.005	0.003	0.006	5.61	0.003	0.164	<0.001	0.005	<0.01	<0.001	0.03	0.016										
21/05/2019	Baseline 8	-	DAM	SW	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.02	0.002	0.022	<0.001	0.09	<0.001	<0.001	<0.001	0.001	0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.01	<0.005	1.29	0.002	0.026	<0.001	0.09	<0.001	<0.001	<0.001	0.002	0.92	<0.001	0.081	<0.001	0.002	<0.01	<0.001	0.01	<0.005										
4/07/2019	Baseline 9	-	DAM	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.02	0.001	-	-	-	<0.001	<0.001	-	0.001	<0.05	<0.001	-	<0.001	<0.001	-	-	-	<0.005	1.36	0.002	-	-	-	<0.001	<0.001	-	0.002	1.09	<0.001	-	<0.001	0.002	-	-	-	<0.005										
4/07/2019	Baseline 9	DAM	QAQC11	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.03	0.001	-	-	-	<0.001	<0.001	-	<0.001	<0.05	<0.001	-	<0.001	<0.001	-	-	-	<0.005	1.24	0.002	-	-	-	<0.001	<0.001	-	0.002	0.90	<0.001	-	<0.001	0.001	-	-	-	<0.005										
30/07/2019	Baseline 10	-	DAM	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.03	0.001	0.024	<0.001	0.15	<0.001	<0.001	<0.001	0.001	<0.05	<0.001	0.002	<0.001	0.001	<0.01	<0.001	<0.01	<0.005	1.64	0.002	0.031	<0.001	0.14	<0.001	<0.001	<0.001	0.002	1.09	<0.001	0.049	<0.001	0.002	<0.01	<0.001	<0.01	0.008										
28/08/2019	Baseline 11	-	DAM	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.02	0.001	0.017	<0.001	0.15	<0.001	<0.001	<0.001	<0.001	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.01	<0.005	3.06	0.002	0.021	<0.001	0.17	<0.001	0.002	0.001	0.003	2.15	<0.001	0.068	<0.001	0.002	<0.01	<0.001	0.01	0.006										
Alick Creek U/S																																																												
5/07/2018	Baseline 2	-	A-CK	SW	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.05	0.002	0.042	<0.001	0.11	<0.001	<0.001	<0.001	0.066	0.07	0.004	0.01	<0.001	0.007	<0.01	0.002	0.02	0.073	13.00	0.003	0.096	<0.001	0.11	<0.001	0.008	0.004	0.014	9.20	0.003	0.146	<0.001	0.008	<0.01	0.002	0.04	0.025										
02/08/2018	Baseline 3	-	AC-US	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.14	0.003	0.031	<0.001	0.13	<0.001	<0.001	<0.001	0.015	0.08	<0.001	0.002	<0.001	0.002	<0.01	0.002	0.02	<0.005	10.20	0.003	0.089	<0.001	0.14	<0.001	0.006	0.003	0.011	6.94	0.002	0.076	<0.001	0.006	<0.01	0.003	0.03	0.016										
26/03/2019	Baseline 7	-	AC-US	SW	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<0.01	0.003	0.032	<0.001	0.06	<0.001	<0.001	<0.001	0.007	<0.05	<0.001	0.003	<0.001	0.001	<0.01	<0.001	0.02	0.010	3.19	0.004	0.06	<0.001	0.07	<0.001	0.002	0.001	0.004	2.33	0.002	0.075	<0.001	0.003	<0.01	<0.001	0.03	0.008										
21/05/2019	Baseline 8	-	AC-US	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	<0.01	0.001	0.035	<0.001	0.07	<0.001	<0.001	<0.001	0.004	<0.05	<0.001	<0.001	<0.001	0.001	<0.01	0.001	0.01	<0.005	9.02	0.002	0.072	<0.001	0.08	<0.001	0.006	0.003	0.009	6.62	0.004	0.103	<0.001	0.006	<0.01	0.001	0.02	0.021										
30/07/2019	Baseline 10	-	AC-US	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.02	0.002	0.029	<0.001	0.10	<0.001	<0.001	<0.001	0.004	<0.05	<0.001	<0.001	<0.001	0.001	<0.01	0.001	0.01	<0.005	3.04	0.002	0.046	<0.001	0.10	<0.001	0.002	0.006	0.006	2.23	<0.001	0.132	<0.001	0.004	<0.01	0.001	0.02	0.008										
Finders River U/S																																																												
5/07/2018	Baseline 2	-	FL-US	SW	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<0.01	0.001	0.063	<0.001	<0.001	<0.001	<0.001	0.009	<0.05	<0.001	0.001	<0.001	0.001	<0.01	<0.001	<0.01	0.006	0.46	0.001	0.06	<0.001	<0.05	<0.001	<0.001	<0.001	0.002	0.40	<0.001	0.052	<0.001	0.002	<0.01	<0.001	<0.01	<0.005											
01/08/2018	Baseline 3	-	FL-US	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	<0.01	0.001	0.062	<0.001	0.06	<0.001	<0.001	<0.001	0.003	<0.05	<0.001	0.002	<0.001	0.001	<0.01	0.001	<0.01	<0.005	0.58	0.002	0.069	<0.001	0.05	<0.001	<0.001	<0.001	0.002	0.55	<0.001	0.037	<0.001	0.002	<0.01	0.001	<0.01	<0.005										
29/08/2018	Baseline 4	-	FL-US	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	0.02	0.001	0.057	<0.001	0.05	<0.001	<0.001	<0.001	0.003	<0.05	<0.001	0.007	<0.001	0.001	<0.01	0.001	<0.01	<0.005	0.24	0.001	0.061	<0.001	0.06	<0.001	<0.001	<0.001	0.003	0.21	<0.001	0.029	<0.001	0.002	<0.01	0.001	<0.01	<0.005										
26/09/2018	Baseline 5	-	FL-US	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	<0.01	0.001	0.066	<0.001	0.08	<0.001	<0.001	<0.001	0.003	<0.05	<0.001	0.005	<0.001	0.002	<0.01	0.001	<0.01	<0.005	0.32	0.002	0.073	<0.001	0.11	<0.001	<0.001	<0.001	0.002	0.31	<0.001	0.051	<0.001	0.002	<0.01	0.001	<0.01	0.013										
25/10/2018	Baseline 6	-	FL-US	SW	<20	<100	<100	<100	<1	<2	<2	<2	<2	<2	<0.01	0.003	0.053	<0.001	0.16	<0.001	<0.001	<0.001	0.002	<0.05	<0.001	0.003	<0.001	0.002	<0.01	0.002	<0.01	<0.005	1.57	0.003	0.064	<0.001	0.17	<0.001	0.001	<0.001	0.003	1.21	<0.001	0.085	<0.001	0.003	<0.01	0.00												